

and New England coasts, when high westerly winds prevailed at nearly all of them, while signals had been ordered for the exposed stations alone.

NAVIGATION.

Height of Rivers.—Upon chart No. III is a table giving the highest and lowest water-marks, with the dates upon which they occurred. The *Red river* rose slowly, but steadily, at Shreveport, from 4 ft. 5 in., 1st, to 11 ft. 8 in., 31st. In the *Arkansas*, at Little Rock, the fluctuations were very slight, and the water continued low; it was frozen over the 8th. The *Missouri* and *Upper Mississippi* continued frozen over and low the entire month. *Lower Mississippi.*—Navigation suspended between Memphis and Cairo till the 14th, when the ice-gorges passed off. Below Cairo the rise continued to the close of the month, due to the water from the Ohio, Cumberland and Tennessee rivers. From Cairo to St. Louis the ice blockade continued at the end of the month. *Cumberland.*—The ice-gorges below Nashville moved down on the 10th and 11th, after which navigation was resumed. *Tennessee.*—At Paducah the ice-gorge moved out into the Ohio the 15th. *Alleghany.*—Closed during the month. *Monongahela.*—Ice-gorges passed off on the 13th and 14th, with great destruction. *Ohio.*—At Cairo the river was clear on the 12th. The ice-gorges moved some on the 9th at Ironton, O.; 12th and 13th, at Cincinnati. On the 14th there was a general movement of the ice from Pittsburgh to Paducah, which commenced passing Cairo the 15th, after which the resumption of navigation took place. The loss of property above Louisville was very heavy in the shape of steamers, barges, coal, &c. *Potomac.*—At Georgetown, D. C., the ice-gorge gave way the 18th, damaging vessels and property along the banks. *Hudson.*—At Garrison's, opposite West Point, has remained open, but above and below teams cross on the ice.

TEMPERATURE OF WATER.

As heretofore, the maximum and minimum temperatures alone, with the average depth of the water, are given in the table on chart No. II.

ATMOSPHERIC ELECTRICITY.

Thunder-storms.—1st, Daytona, Fla.; St. Mary's, Ga. 7th, Howard, Neb. 8th and 12th, Fayette, Miss. 14th, Santa Fe; Sedgewick, Kan. 15th, St. Louis; Anna, Ill.; Brookhaven, Miss.; Weldon, N. C.; Jackson, Tenn. 17th, Mobile; Fayette, Miss. 18th, Montgomery. 20th, Galveston. 21st, Charleston; Galveston; Tybee Island, Ga.; New Orleans. 22nd, Tybee Island; New Orleans; Fayette, Miss. 23rd, Aiken, S. C. 25th, Melissa, Tex. 28th, San Bernardino, Cal. 30th, Stanley, Kan.; Starkey, N. Y.; Oregon, Mo.

Distant Lightning.—13th, Fayette, Miss. 17th, Montgomery. 19th, Jackson, Tenn. 20th, Atlanta, Ga. 21st, Savannah. 27th, Portsmouth, N. C.

Auroras.—6th, Cornish, West Waterville, Surry, Gardiner, Standish and Orono, Me; St. Paul, Duluth, Breckenridge and Minneapolis, Minn.; Malone, N. Y.; Fort Pembina and Bismarck, Dak.; West Charlotte, Vt. 7th, Gardiner, Me.; Minneapolis, St. Paul and Duluth, Minn.; Escanaba; St. John's, N. F. 8th, Escanaba. 13th, Wappinger's Falls, N. Y. 14th, Gardiner, Me.; Waltham, Mass.; North Argyle, N. Y.; Fort Pembina, Dak. 15th, Duluth; Fort Pembina, Dak. 16th, Fort Brady, Mich. 19th, Denver. 20th, Hillsboro, Ohio.

Electric Ground Currents.—The observer at Barnegat, N. J., reports strong electric currents on the 17th; the telegraph line was working at 6 p. m., although grounded north and south.

OPTICAL PHENOMENA.

Solar Halos.—1st, Iowa, Minn., N. H., N. Y., Penn. 2nd, Iowa, N. Y., Penn. 3rd, Ill., N. Y. 4th, Me., Neb., Vt. 5th, Dak., Ill., Ind., Mich., Minn., Neb., N. Y., Ohio. 6th, Cal., Ill., Mass., Mich., N. Y., Ohio, Vt. 7th, Iowa, La., Minn., Miss., Neb. 8th, Dak., Ill., Mass., Minn., N. H., R. I. 9th, Conn., Ind., Mich., Minn., Neb., Ohio, Penn. 10th, Mass., Minn., R. I., Tenn. 11th, Iowa, Me., Mass., Neb., N. H., N. J., N. Y., Penn. 12th, Me., Neb., N. J., N. Y., Vt. 13th, N. H., Vt. 14th, Dak., Ill. 15th, Col., Dak., Ga., Iowa, Neb., S. C. 16th, Dak., Ga., Ill., Mich., S. C. 17th, Me., Minn., Neb., N. H., N. Y., R. I. 18th, Minn., Neb. 19th, Col., Dak., N. Y., Va. 20th, Dak., Ga., Iowa, Minn., Neb. 21st, Iowa, Kan., Minn., Neb., N. Y., Ohio, S. C. 22nd, Col., Ind., Ohio. 23rd, Can., Iowa, Minn., Penn. 24th, Iowa, N. Y. 25th, N. J., N. C., Ohio, S. C., Vt. 26th, Me., N. H., Vt. 27th, Ill., Texas. 28th, Ill., Me., N. H., N. Y., Tenn., Vt. 29th, Ill., Mich., Minn., N. Y., Tenn. 30th, Ill., Ind., Mich., Ohio. 31st, Ala., Me., Minn., Miss., N. H., N. Y., Tenn.

Lunar Halos.—1st, Dak., Iowa, Penn., Tenn., Va. 2nd, Ill., Iowa, Minn., N. Y., N. C., Tenn., Wis. 3rd, Dak., Iowa, Ohio, Tenn. 4th, Vt. 5th, Ind., Mo., Neb., N. J., Ohio, Tex. 6th, Cal., Mass., N. H.,

N. J., N. Y., Ohio. 7th, Neb. 8th, Del. 18th, Dak., Mass., Minn., N. Mex. 19th, Conn., Dak., Kan., Mass., Minn., Mich., N. C., R. I. 20th, Ark., Conn., Ga., Ky., Mass., Minn., Mo., N. J., N. C., Ohio, Tenn. 21st, Conn., Fla., Ind., Iowa, Me., Mass., Mich., Minn., Neb., N. H., N. Y., Ohio, Penn., R. I. 22nd, Dak., Ind., Me., Mass., N. H., N. J., N. Y., Ohio, Penn., Tenn., Vt. 23rd, Cal., Can., Ill., Iowa, Me., Mo., N. J., N. Mex., N. Y., Va. 24th, Cal., Can., Iowa, Kan., Minn., Mo., Neb., N. Mex., N. C. 25th, Cal., Conn., Ga., Iowa, Kan., Mass., Mo., N. H., N. J., N. Y., N. C., Ohio, R. I., S. C., Tenn., Vt. 26th, Cal., Ind., Iowa, Me., Mass., Mich., Miss., Mo., N. J., N. Mex., N. Y., Tenn., Wis. 27th, Ala., Cal., Iowa, Mass., Mich., Minn., Mo., N. J., N. C., Or., R. I., Tex. 28th, Ala., Iowa, Kan., Me., Mass., Mo., Mont., N. J., N. Mex., N. Y., N. C., Penn., Tex., Wis. 29th, Ala., Cal., Ind., La., Me., Mass., Mich., Min., N. C., Ohio, Tenn., Wis. 30th, Conn., Minn., Ohio, N. C., Tex., Va. 31st, Ala., Can., Del., Ind. Ty., Miss., N. C., S. C., Tex., Tenn., La.

Mirage.—Ga., Tybee Island, 3rd, 4th, 9th; Neb., Genoa, 4th, 24th, 26th; Me., Standish, 11th, 17th, 26th, 31st; Minn., Breckenridge, 15th, 22nd, 25th, 27th; Mass., New Bedford, 28th.

MISCELLANEOUS PHENOMENA.

Zoological.—*Wild geese* were observed at Baxter Springs, Kan., 5th and 6th, and flying south 29th; Sedgwick, Kan., NE., 22nd; Melissa, Texas, S., 5th and 30th, N., 27th; Nashville, E., 18th; Corning, Mo., 25th; Abington, Ill., N., 29th; Havana, Ill., abundant three last days of month; Afton, Iowa, and Benettsville, Ky., N., 31st. *Wild ducks*, Fort Macon, N. C., flying S., 19th and 24th; New Bedford, Mass., seen in large numbers 29th and 30th; Golden, Col., and Stanley, Kan., N., 30th; Havana, Ill., abundant three last days of month. *Bluebirds* seen at Weldon, N. C., 14th; Benettsville, Ky., 16th; Austin, Tenn., 26th; Chambersburg, Pa., 27th; Cleveland, Tenn., 28th; Accotink, Va., and Fallsion, Md., 29th; Baxter Springs, Kan., and Morgantown, W. Va., 31st; Ringgold, Ohio, during last of month. *Robins* appeared at Morgantown, W. Va., 23rd; Lynchburg, Va., 28th; Fort Madison, Iowa, 30th; Afton, Iowa, 31st. *Redbirds* appeared at Alto Vista, Va., 10th; Morgantown, W. Va., 23rd. *Blackbirds* seen at Golden, Col., flying NW., 31st. *Mockingbirds* appeared at Welborn, Fla., 23th. *Golden Winged woodpecker* seen at Abington, Ill., 31st. *Bees* were out at Afton, Iowa, and Oregon, Mo., 31st. *Reptiles*.—Concerning the reported shower of snakes at Memphis on the 15th, the following is taken from the observer's report: "Morning opened with light rain; 10:20 a. m. began to pour down in torrents, lasting fifteen minutes, wind SW.; immediately after the reptiles were discovered crawling on the sidewalks, in the road, gutters and yards of Vance street, between Landerdude and Goslee streets, two blocks; careful inquiry was made to ascertain if anyone had seen them descend, but without success; neither were they to be found in the cisterns, on roofs, or any elevations above the ground; Vance street is comparatively new, has no pavements, gutters merely trenches; I heard of none being found elsewhere; when first seen they were a very dark brown, almost black; were very thick in some places, being tangled together like a mass of thread or yarn."

Meteors.—1st, Ky. 3rd, Conn., Penn. 4th, Mo. 5th, N. Y. 7th, Iowa. 8th, N. C. 9th, Penn. 13th, N. J. 15th, Iowa, W. Va. 20th, Ky. 23rd, Ohio. 24th, Mass., N. J. 26th, Fla. 27th, Iowa, La. 30th, Ky., Penn.

Ice-bergs.—Lat., 44° 15' N., long., 44° 40' W., 23rd.

Polar Bands.—Me., Gardiner, 1st, 8th, 12th, 21th, 27th. Wis., Milwaukee, 2nd. Va., Wytheville, 3rd, 23rd, 31st. Ga., Tybee Island, 5th, 8th. Ohio, Carthage, 6th, 9th, 14th, 18th, 21st, 25th, 27th. Fla., Daytona, 11th. Iowa, Guttenburg, 12th, 29th; Iowa City, 13th, 25th, 27th; Tabor, 31st. Minn., Duluth, 17th, 23rd, 24th, 25th; St. Paul, 26th. Ky., Benettsville, 25th. N. H., Contoocookville, 31st.

Zodiacal Light.—Ga., Savannah, 2nd, 4th, 30th. Mass., Somerset, 4th, 5th, 7th, 9th. Florida, 5th. Ohio, Bellefontaine, 4th, 5th, 14th, 17th, 31st. N. J., Atco, 4th, 9th. N. Y., Waterburgh, 5th, 13th, 17th.

PUBLISHED BY ORDER OF THE SECRETARY OF WAR.

Albert J. Meyer

Brig. Gen. (Bot. Assg'd.) Chief Signal Officer, U. S. A.